

PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

PCT

To:

Johnson, Ian
IP QINETIQ FORMALITIES
Cody Technology Park
A4 Building, Room G016
Ively Road, Farnborough
Hampshire GU14 0LX
GRANDE BRETAGNE

AST/CY

NOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL PRELIMINARY
EXAMINATION REPORT

(PCT Rule 71.1)

Date of mailing
(day/month/year)

04.10.2004

Applicant's or agent's file reference
IP/P7037/WOD

IMPORTANT NOTIFICATION

International application No.
PCT/GB 03/04001

International filing date (day/month/year)
17.09.2003

Priority date (day/month/year)
20.09.2002

Applicant
QINETIQ LIMITED et al

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.
4. **REMINDER**

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

The applicant's attention is drawn to Article 33(5), which provides that the criteria of novelty, inventive step and industrial applicability described in Article 33(2) to (4) merely serve the purposes of international preliminary examination and that "any Contracting State may apply additional or different criteria for the purposes of deciding whether, in that State, the claimed inventions is patentable or not" (see also Article 27(5)). Such additional criteria may relate, for example, to exemptions from patentability, requirements for enabling disclosure, clarity and support for the claims.

Name and mailing address of the international preliminary examining authority:



European Patent Office
D-80298 Munich
Tel. +49 89 2399 - 0 Tx: 523656 epmu d
Fax: +49 89 2399 - 4465

Authorized Officer

Weman, E



Tel. +49 89 2399-7961



PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT (PCT Article 36 and Rule 70)

Applicant's or agent's file reference IP/P7037/WOD	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA416)	
International application No. PCT/GB 03/04001	International filing date (day/month/year) 17.09.2003	Priority date (day/month/year) 20.09.2002
International Patent Classification (IPC) or both national classification and IPC G01S3/08		
Applicant QINETIQ LIMITED et al		
<p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 5 sheets, including this cover sheet.</p> <p><input type="checkbox"/> This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of sheets.</p>		
<p>3. This report contains indications relating to the following items:</p> <ul style="list-style-type: none"> I <input checked="" type="checkbox"/> Basis of the opinion II <input type="checkbox"/> Priority III <input checked="" type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability IV <input type="checkbox"/> Lack of unity of invention V <input checked="" type="checkbox"/> Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement VI <input type="checkbox"/> Certain documents cited VII <input type="checkbox"/> Certain defects in the international application VIII <input type="checkbox"/> Certain observations on the international application 		
Date of submission of the demand 08.04.2004	Date of completion of this report 04.10.2004	
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Fanjul Caudevilla, J Telephone No. +49 89 2399-2533 <div style="text-align: right;">  </div>	

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. **PCT/GB 03/04001**

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, Pages

1-21 as originally filed

Claims, Numbers

1-27 as originally filed

Drawings, Sheets

1/8-8/8 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
☐ the language of publication of the international application (under Rule 48.3(b)).
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority in written form.
☐ furnished subsequently to this Authority in computer readable form.
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/GB 03/04001

Re Item III

Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The International Search Report has been produced only for the first of the inventions included in the application (claims 1-25). Therefore, the present IPER covers only claims 1 - 25.

Re Item V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. The following documents from the International Search Report are considered as being the most relevant prior art:

D1: GB-A-2336741

D2: US-A-5724047

D3: US-A-6121927

D4: US-A-4131873

D5: US-A-4800541

D6: US-A-5570323

2. The solution proposed in independent claims 1 and 25 of the present application cannot be considered as novel (Article 33(2) PCT) for the following reasons.

D1 discloses (figures 1, 3, 5; abstract; page 14, line 19 - page 24, line 14) a signal arrival direction finder. A cross-correlation function with time lags of the received signals is obtained by inverse modulating despread output signals by a known symbol in an inverse modulator 8. An arrival direction of a received signal is estimated by an arrival direction estimation unit 6 based on the cross-correlation function.

The system of D1 discloses thus all the features of claim 1, namely:

receiver means providing temporally output pulses in response to a single received pulse (antennas 1-0, 1-1; despreading units 3-0, 3-1);

cross-correlation means for cross-correlating the output pulses (inverse modulator 8; arrival direction estimator 6)

Moreover, D2 (cf. figure 4; column 4, lines 19-67) anticipates all the technical features of independent claims 1 and 25. This document discloses an interferometric direction finding system. Ambiguities are resolved using TDOA, which is measured by correlating the phase and frequency of modulated signals received in two antennas.

4. Dependent claims 2-7 and 10-24 do not contain any additional features which, in combination with the features of any claim to which they refer, meet the requirements of inventive step (Article 33(3) PCT). They are either known from the prior art documents cited above or they are considered to be common design measures within the normal range of options envisaged by a person skilled in this art. In particular:

Claims 5-6. D4 discloses the use of movable receivers (figure 1; column 3, line 16 - column 4, line 23).

Claim 7, 10-12, 16-23: D1 and D5 discloses the use of temporary spaced code sequences and autocorrelation with a replica of the transmitted signal.

Claims 13-14: D3 discloses (figures 1-8; column 4, line 66 - column 6, line 50) a procedure for computing the bearing of a source from the arrival time differences of the multipath propagated signal. The propagation time difference of each response is set equal to the propagation delay value giving the maximum correlation with a previous estimate of the radio channel impulse response. Therefore, the effect of multiple paths are taken in to account in the calculation of the bearing.

5. The solutions proposed in claims 8 and 9 are considered as involving an inventive step (Article 33(3) PCT). None of the prior art documents cited above discloses Doppler means for determining Doppler parameter from the output of the cross-correlation means and resampling means for resampling the output of the receiver means in response to the output of the Doppler means.

**INTERNATIONAL PRELIMINARY
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International application No. **PCT/GB 03/04001**

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application,

☐ claims Nos.

because:

☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (specify):

☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. are so unclear that no meaningful opinion could be formed (*specify*):

☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.

☒ no international search report has been established for the said claims Nos. 26,27

2. A meaningful international preliminary examination cannot be carried out due to the failure of the nucleotide and/or amino acid sequence listing to comply with the standard provided for in Annex C of the Administrative Instructions:

☐ the written form has not been furnished or does not comply with the Standard.

☐ the computer readable form has not been furnished or does not comply with the Standard.

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	2-24
	No: Claims	1,25
Inventive step (IS)	Yes: Claims	8,9
	No: Claims	2-7,10-24
Industrial applicability (IA)	Yes: Claims	1-25
	No: Claims	

2. Citations and explanations

see separate sheet